

## THE "DETOXX" SYSTEM: DETOXIFICATION OF BIOTOXINS IN CHRONIC NEUROTOXIC SYNDROMES By John Foster, M.D., Neal Speight, M.D., Patricia Kane, Ph.D.,

{Dr. Braun's corrections or additions or rearrangements are in "{...}" and in italics. Where I would take out a word, the word or words are printed smaller. Also I underline the main idea phrase in some of the sentences.

Also, I reduced the font size of the references so they would not slow down the reading for content.}

### INTRODUCTION TO OUR CLINICAL RESEARCH

We, { *the authors* } have established a biomedical protocol in our clinics, The Haverford Wellness Center in Havertown, Pennsylvania and The Center for Wellness in Charlotte, North Carolina, for patients with neurotoxic illness. Our biomedical approach is an attempt to reach the *systemic* nature of these tenacious neurotoxic syndromes and provide clinically proven methods that eradicate neurotoxins. Our course of action is that of freeing the patient of pervasive symptoms of neurotoxic illness in a noninvasive manner that heals the membrane, and ultimately the body and brain.

#### **{A CURSORY EXPLANATION OF NORMAL CELL MEMBRANES**

*better stated at the beginning of the article, as least for my reading -so I moved it and repeat it below !}*

An optimum balance of fatty acids make up the dynamic {*cell*} membrane. {*whether neural, hepatic, endothelial, etc.*} The membrane of every living cell and organelle is composed of two fatty acid tails facing each other. This bilipid layer is so minute (3.5 nanometers) that it would take 10,000 membranes layered on top of each other to make up the thickness of this paper. Yet the dynamics that occur within this tiny envelope with organelles prancing up and down the cytoskeleton microtubules is a microcosm that is a challenge for the human mind to envision. Mercury toxicity damages the microtubule structure of the cell.<sup>1</sup> All cells must synthesize molecules and expel waste.

All cells must create, through gene expression, the proteins needed for cellular gates {*receptor sites*} embedded in the membrane, {*that serve*} as ion channels and receptors. The ultimate control of how those peptides behave rests with the character of the membrane while the integrity of the membrane rests with the structural (oleic, stearic, palmitic, cholesterol) and essential lipids (omega 6, omega 3). Without control of membrane function through lipid manipulation, detoxication is compromised. In essence, the life of the cell is intimately tied to health of the membrane and the health of the entire organism.

{*Back to their introduction*}

The recent pioneering work of Ritchie Shoemaker, M.D., as communicated in his book *Desperation Medicine* and his peer reviewed papers (Shoemaker 2001), lends strong support to a connection between Chronic Fatigue Syndrome (abbreviated as CFIDS), Fibromyalgia (FMS), Lyme Disease, Pfiesteria infection and that of numerous Neurotoxic Syndromes.<sup>2</sup>

Chronically ill individuals {*who are*} suffering from neurotoxin exposure {*include*} impacts patient populations with CFIDS, Fibromyalgia, MS (multiple sclerosis), Autism, Cardiovascular Disease, Depression, Rheumatoid Arthritis, IBS (irritable bowel syndrome), Infertility, ALS (amyotrophic lateral sclerosis, Lou Gerig's Disease), Parkinson's Disease, Lyme Disease (LD), Toxic Building Syndrome, Estuary Associated Syndrome <sup>3</sup>, Psychosis, Diabetes without family history, Optic Neuritis, Refractory Heavy Metal Toxicity, Pulmonary Hemorrhage, Stroke, {*and others I am sure*}. <sup>4</sup> Patients diagnosed with *all* these chronic illnesses may be potentially classified as "Neurotoxic Membrane Syndrome" (NMS) with the endothelial cell membrane of the blood vessels {*and the neuronal sheath or cell membrane of the nerve bodies and axons and dendrites themselves*} as the target{s} of degeneration.

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<sup>1</sup> {*as do other heavy metals , each having an affinity for different cells or organs or organelles*}

<sup>2</sup> {*Shoemaker is responsible for the neuro-optic test on the computer you can take for \$ 15.00 and is responsible for using cholestyramine to resorb entero-hepatic cycling neurotoxins excreted by the liver.*}

<sup>3</sup> {*This is the dinoflagellate Pfiesteria, gotten from eating fish from the Chesapeak Bay, that Shoemaker works on, noted below.*}

<sup>4</sup> {*That really does includes most of the patient's I see, and it foreshadows heart disease and stoke and is undoubtedly implicated in cancer as well. Illness and aging involve membrane physiology as you will see on reading this slowly.*}

While hypercoagulation <sup>5</sup> involves a myriad of proteins, it is ultimately a membrane event, essentially disrupting the phospholipids that {make up the} structure of the membrane. Agglomeration <sup>6</sup> (blocked cellular exposure to blood flow/nutrients and impaired cell-to-cell communication) indicates elevation of phospholipase A2 *{this enzyme will come up again and be expounded some, just hang onto the abbreviation PL A2}* and the uncoupling of eicosanoids <sup>7</sup> from the cell membrane causing inflammation. The agglomeration *on the surface of the membrane*, that eventually occurs is, in essence, *a product of a weakened membrane, and ultimately a disturbed red cell fatty acid profile* <sup>8</sup>.

### BIOTOXINS AS NEUROTOXINS

As the fat soluble neurotoxins, from where-ever (from sinus,<sup>9</sup> lung, eye, skin, or the GI tract) and are absorbed and then move through the cells of the body to muscle, joint, nerve, heart -- they eventually enter the liver and the bile. The bile formation within the liver, the biliary tree which branches from the liver, and the gall bladder serve in the vital processes of detoxication (disposal of waste products: bilirubin, heavy metals, biotoxins, xenobiotics, etc.). The biliary system is tantamount to lipid metabolism, transport and digestion (bile acids). Once neurotoxins bind with bile they have *{renewed}* access to the liver, and the body is poisoned over and over again as the bile is re-circulated (first released into the intestine to digest fats, and then reabsorbed *{a little further along in the bowel creating the enterohepatic, i.e gut-to-liver, circulation}*).<sup>10</sup>

Abnormalities of the hepatobiliary system may involve biliary stasis *{stasis = poor flow, like static, stagnant water}* creating biliary sludge. The occurrence of biliary sludge may be due to prolonged fasting, low fat intake, high carbohydrate diets or exposure to pathogens,<sup>11</sup> whereby infectious material or biotoxins reside within the liver, biliary tree and gall bladder, in the viscous suspension of biliary sludge. Restriction of dietary fat may impair biliary flow which would be contraindicated in attempting to clear toxicity as bile is paramount to cleansing the body and getting biotoxins and heavy metals excreted into the fecal matter.<sup>12</sup>

Biotoxins {from} as bacteria, viruses, parasites, spirochetes, dinoflagellates, and fungus may be within biliary sludge often creating neurotoxins *{i.e. their waste products are neuro toxic}*,<sup>13</sup> impacting the CNS *{central nervous system}* via the ENS (Enteral {gut} Nervous System), or the Second Brain (gut).<sup>14</sup>

The presentation of biotoxin exposure often parallels neurological and psychological impairment due to the interrelationship between the ENS (Enteral {gut} Nervous System) and the CNS.

*{ go slowly here, this is very important}*

Neurotoxins are minute compounds between 200-1000 KD (kilodaltons) that are comprised of oxygen, nitrogen and sulfate atoms arranged in such a way as to make the outside of the molecule fat-loving and water-hating. As such, once it enters the body, it tends to bind to structures that are rich in fat such as most of our cells, especially the liver, kidney, and brain *{but including every cell's lipid membrane and the membranes inside the cells, as around the mitochondria, nucleus and other organells.}* Neurotoxins are capable of dissolving in fatty tissue and moving through it, crossing cell membranes (transporting against a gradient, particularly with potassium) disrupting the electrical balance of the cell itself. {this is where magnetism, when

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<sup>5</sup> *{Hypercoagulation means : increased amount and speed of blood clotting, accounting for thrombi, or blood clots, both of small, or microsize, and large fatal size. The cause of blood vessel occlusion, heart attacks, strokes, leg clots, etc.}*

<sup>6</sup> *{Agglomeration means: the blood cells are sticky with globulins and other proteins , or antibodies, and adhere together like a stack of pennies and run through the blood vessels and on the "next door to the individual cells of the body level" - in the capillaries, as a stack, so that oxygen release can only occur on the front and back side of the stack and all the in between red cells are just sandwiched in for the ride, not delivering any oxygen. No wonder we are tired. This is the thing that medical use of magnets addresses.}*

<sup>7</sup> *{ Eicosanoids: as you will read later on, a type of fatty acid, and further explained later.}*

<sup>8</sup> *{Actually it is the same disrupted profile in all the cells of the body. He is referring to the tests done: it is measured in the red cell, because to do so merely requires drawing a tube of blood, rather than doing some biopsy.}*

<sup>9</sup> *{this correlates with myotoxins, seated in fungi in the sinuses, causing neural disease, as several of us have discussed.}*

<sup>10</sup> *{another description of entero-hepatic re-circulation}*

<sup>11</sup> *{or food allergy, which is a toxic state.}*

<sup>12</sup> *{you will soon recognize they are talking about good fat, not bad fat.}*

<sup>13</sup> *{just as ethanol is a waste product of yeasts, known to produce brain toxicity, commonly called drunkenness, worldwide; and Seran gas, used on the Tokyo subway, with fearsome fatality, is a fungal waste byproduct.}*

<sup>14</sup> *{calling the bowel an Enteral Nervous System, or second brain, was a unique idea to me, but understanding the bowel importance, that is a concept easy enough to accept, especially if you connect the gut to the liver function.}*

*used properly, would intersect with membrane therapy, and make sense - if one could understand this sort of thing, and goodness knows, I only have an inkling of understanding.}*

Neurotoxins cause damage by *{ I have organized this into a list}*

1. disrupting *sodium-potassium* and *calcium-magnesium* *{and other}* channel receptors,
2. attacking enzyme reactions involved in glucose production thereby disrupting energy metabolism in the cell,
3. manufacturing renegade fatty acids as *saturated very long chain, odd chain and branched chain fatty acids*
4. impairing membrane function,
5. stimulating enzymes (PL A2) which *uncouple essential fatty acids from the cell membrane* and
6. impairing the function of the nuclear receptor PPAR gamma which partially controls transcription (the conversion of instructions held in our DNA to RNA which then leads to translation or protein production in the cell) *or to mistranslation, i.e. defective gene function}*

*{This last, # 6 means : genetic changes are caused which lead to the definable diseases. Standard medicine is busy chasing the genes that cause these named diseases, as a means of calling all disease "our own fault" since it is in our genes. This covers up the biological facts: that environmental pollution is ruining our genes and causing illness and disease. Basically, it isn't our fault, but they are not compelled to clean up the environmental <sup>15</sup> mess they have made, since it is our own fault, i.e. a "flaw" in our own genes.}*

### **HEAVY METALS RESIDE IN FATTY TISSUE WITH BIOTOXINS**

Heavy metals are also lipid soluble and often compound the removal of biotoxins (Aschner et. al. 1990, 1998; Dutzak 1991). As has been observed by many clinicians, often as the patients' heavy metal toxicity is addressed they are faced with the additional complication of the presence of biotoxins. Biotoxins and heavy metal exposure co-exist within the cell membrane and fatty tissue *requiring consideration* for both types of toxicity in regard to patient intervention.

By stabilizing glutathione we<sup>16</sup> in turn impact metallothionein markers (Nordberb and Nordberb 2000, Ebadi et al 1995, Sato et al 1995, Kerper et al 1996, Susanto et al 1998), glycoaminoglycans or GAGS (Klein 1992), methylation, sulfation, and thus hepatic and renal function as we introduce treatment protocols for detoxication with gentle, natural modalities that unload cellular toxicity safely.<sup>17</sup> GSH *{glutathione}* infusion by fast IV push<sup>18</sup> has been a remarkable tool to unload the body burden of heavy metals and neurotoxins in both pediatric and adult populations, without side effects. *{This is often applied following the PC IV}*

### **RENEGADE FATTY ACIDS AS NEUROTOXIN MARKERS**

***{VLCSFAs, which are very long chain saturated fatty acids, & Odd Chain fats, & Branched Chain fats BCFA}***  
*{ the importance of diet after all; also including "transfatty acids" as in fried foods, etc.}*

Renegade fats, as very long chain fats (VLCFAs, odd and branched chains) that are over expressed<sup>19</sup>, disrupt the membrane structure. There is a beautiful geometry to the membrane that is highly sensitive to the size *{length}* of the lipid chains. The overall width of the fatty acid portion of the membrane is ~3 ½ nm *{nanameters}* which must be maintained for stability *{and fluidity of the membranes}*. Saturated or monounsaturated fatty acids with a length of 16 or 18 carbons and polyunsaturated fatty acids of 18 to 22 carbons are preferred in order to permit the structure to maintain optimal horizontal fluidity. VLCSF, that range from 20 to 26 carbons force the parallel dimensions vertically. There simply is not enough room *{for the length of the carbon chains, so they curve up and out, or buckle, and distort the top and bottom sides of the membranes, making them irregular and bumpy}*. The distortion weakens the phosphate bonds that derive *{sustain or maintain}* their strong attraction only as long as the phospholipids are parallel to each other on both sides of the membrane. The cell weakness is then expressed in *{1}* leaky attraction to ion channels <sup>20</sup> and *{2}*

<sup>15</sup> *{ and who is this "immaculate they"? Never mind. Doesn't matter, as we can't do anything about that anyway}*

<sup>16</sup> *{ I think they mean "we" as the three authoring doctors in their respective clinics}*

<sup>17</sup> *{Sorry. This messed up sentence is hard to untangle; just do your best.}*

<sup>18</sup> *{GSH is glutathione. NAC does this orally, and can be used freely once mercury load is reduced. Our detox IVs do include GSH}*

<sup>19</sup> *{usually acquired by eating them, or eating things that will be precursors to them}*

<sup>20</sup> *{The ion channels they are specking of are Na and K, or sodium and potassium, and calcium and magnesium, or Ca & Mg, at the very least. Remember what I taught you about the calcium channel and the flipping of magnesium. Same for Na and K}*

receptors which marginalize cell cytosol fluids<sup>21</sup> and electrolytes with the only option *{being}* as early cell death.

### THE BRAIN IS COMPRISED OF 60% + FAT

To view the brain beyond its architecture as a biological orchestration of the physical and chemical constituents necessary for performance, we cannot begin to conceptualize without considering the importance of fatty acids, as the human brain is 60% + lipid. Dendrites and synapses are up to 80% in lipid content. Although Arachidonic acid (AA) has been given a negative association, it is the most prominent essential fatty acid in the red cell and comprises 12% of the total brain and 15.5% of the body lipid content.<sup>22</sup>

If AA is depleted by overdosing with marine or flax oil establishing the *{proper}* balance of the EFAs is profoundly impaired. Often both prostaglandin one and two series, relating to omega six metabolism, are compromised when flax and marine oils are overdosed or lipid intake is insufficient. When AA, the lead eicosanoid of the body, is suppressed due to excess intake of omega 3 *{fish and flax}*, *{or by}* toxicity or disease, the control circuitry of the body is impaired<sup>23</sup> as is clearly viewed in the patient's presentation *{or clinical picture}*.<sup>24</sup>

Arachidonic acid is preferentially wasted in states of heavy metal toxicity (Tiin and Lin, 1998) and has been observed to be sharply suppressed in RBC lipid analysis in states of heavy metal toxicity (Kane, clinical observation 1997-2002).

### THE FATTY ACID CLEAVING ENZYME PL A2

In states of toxicity via biotoxins or heavy metals there is a dramatic elevation in Phospholipase A2 (PL A2) activity (VERITY ET AL 1994) Increases in PL A2 activity result in premature uncoupling of the essential fatty acids (EFAs) from phospholipids in the cell membrane. Accelerated loss of EFA places the patient in a severely compromised position as that of inflammation which results from the promiscuous release of AA in the presence of an overexpression of PL A2. Carbohydrate consumption, as one of the most profound stimulators of PL A2, must be restricted to control the insulin response and the subsequent loss of EFAs. *{again, a dietary message. Cut the carbs! And remember that all underlining of text is that of Dr. Braun.}*

### PHOSPHOLIPIDS AND NEURONS

Phospholipids, cholesterol, cerebroside, gangliosides and sulfatides are the lipids most predominant in the brain residing within the architectural bilayers (Bazan et al 1992). The phospholipids and their essential fatty acid components provide second messengers and signal mediators *{neurohormones}*. In essence, phospholipids and their essential fatty acid components play a vital role in the cell signaling systems in the neuron. The functional behavior of neuronal membranes largely depends upon the ways in which individual phospholipids are aligned, interspersed with cholesterol, and associated with proteins *{that is, in the cell membrane structure which I have crudely and clumsily described to you}*.

All neurotransmitters<sup>25</sup> are wrapped up in phospholipid vesicles.*{!}*<sup>26</sup> The release and uptake of the neurotransmitters depends upon the realignment of the phospholipid molecules. *{!}* The nature of the phospholipid is a factor in determining how much neurotransmitter or metal ion will pass out of a vesicle or be taken back in.*{!!}*<sup>27</sup> Phospholipid re-modeling may be accomplished<sup>28</sup> by supplying generous amounts of balanced lipids and catalysts via nutritional intervention and the use of intravenous Phospholipid Exchange *{IV Phosphatidyl choline}*.<sup>29</sup>

<sup>21</sup> *{cytosol is the liquid inside the cell that organelles float within. i. e., the cell solution.}*

<sup>22</sup> *{the negative connotation is that AA is found to be high in inflammatory states, such as arthritis, etc. That is because the cells are injured and the AA is freed as the cells are disrupted. That should not imply that AA is the cause of the inflammation any more than a high cholesterol is the cause of vascular disease.}*

<sup>23</sup> *{control circuitry of the body must mean: a neurological disease state. Even so this sentence is still a mess, and while I can read it 2 x and make it out... it still needs some work, right?}*

<sup>24</sup> *{because of this paragraph, I have gone back to my original ratio of omega 3 to omega 6, of 1:3. I got so much flack from other doctors and some "educated patients" on my original 1:3 ratio, I acquiesced and went to 1:1. Now, all of you - take 1 gm of fish or flax, and 3 grams of the combos of primrose, black current, and borage! Yes, go to 3 grams, or 4.}*

<sup>25</sup> *{Neurotransmitters are: serotonin, epinephrine, norepinephrine, etc., all the chemical things connected to depressed, psychoneurotic behavior, and to the day-to-day workings of nerve to organ communication, etc.}*

<sup>26</sup> *{!} etc. I didn't know that!*

<sup>27</sup> *{the reason these therapies are useful in depression and other mental disorders}*

<sup>28</sup> *{Hope, after all. Thank goodness}*

<sup>29</sup> *{The "new" IV, developed in Switzerland, which I started using about 3 months before I got this paper to attempt. It is*

## HYPERCOAGULATION AND MEMBRANE INTEGRITY

*{coagulation means blood clotting, usually inside blood vessels, the endothelium is cells that line the inside of blood vessels; their membranes are the surfaces exposed to the blood and all blood contents, both nutrients and toxins}*

An undesirable course of events in an exposure to biotoxins is agglomeration in a hypercoagulation state. The distorted membrane with its weakened structure and almost absolute reduced fluidity is powerless to resist coagulation. A highly fluid membrane would kick off an accumulation of oxidized cholesterol; it would not permit it to attach. This is not the case when the membrane is compromised, as in much of the patient population affected with neurotoxic illness. *{This implies that toxic patients get vascular disease at an increased rate. We know as well, that they get cancer at higher rates. Toxicity is a component of all disease.}* Hypercoagulation is predominantly a non-regulated mass of proteins *{which is}* disrupting function. When referencing the artery, hypercoagulation invariably involves the plasmic side of the cell<sup>30</sup> and if endothelial cells of the vascular system are targeted by a toxin (virus, neurotoxin, metal, antibody, etc.) , restriction of blood flow ultimately results. *{On the other hand} If a neuron is targeted {by a toxin - again, either virus, chemical neurotoxin, metal, antibody, etc.}, then signaling is disrupted. {This description can be extended to all cells and their special functions, as well.}*

The presence of neurotoxins invariably involves PLA2 *{see above again for definition}*, which is the "sergeant at arms" monitoring cell membrane health. A membrane disturbance (unwanted mass of clot protein, metal, bacteria etc) would trigger PLA2, which hydrolyses the release of eicosanoids, which would then induce inflammation and call to attention the clean-up committee *{cells}*, i.e. the macrophages *{that roam the blood and soft tissues, looking for a mess to clean up}*.

Hypercoagulation is a restrictive agglomeration, (mass) *{"plaque" later, clot}* that occurs principally on the membrane of endothelial cells blocking the flow of vital fluids, blood, bile, etc., with a high causal relationship to oxidation, and equally to toxicity, quite often neurotoxins. Oxidized LDL<sup>31</sup> (Sobel et al 2000) is predominantly a membrane disturbing event, agglomerating and attaching to endothelial cells, while neurotoxins can move through the lipid membrane and attack the cell itself. *{Once the outer cell membrane is sick, toxins enter the cell, and go after the mitochondrial membranes, effecting energy production; then go after the nuclear membrane, effecting genes... and we know where that leads - sick or malformed babies and cancer.}*

## THE LIVER AS THE CENTER OF THE STORM

*{AGAIN WE SEE THE IMPORTANCE OF THE LIVER}*

Unhealthy bacteria have been known to colonize the liver and its biliary system. These bacteria as well as viruses, spirochetes<sup>32</sup>, dinoflagellates, and the like can synthesize very long chain saturated or renegade fats<sup>33</sup> (Harrington et al 1968, Carballerira et al 1998) which lead to liver toxicity, biliary congestion, impairment of prostaglandin synthesis, and the release of glutathione (Ballatori et al 1990).

Lipids vibrate in the cell at millions of times/second. The double bonds of the omega 6 and omega 3 lipids are the singing backbone of life expressed through their high energy level. These bonds are their vibratory song, and they absolutely carry a tune befitting every act and function in the exercise of life, providing all 70 trillion of our cells their *flexible nature*. When renegade fats are over represented in the cell membrane they result in off-key expression, and if strong enough, may spell cellular death and apoptosis. Healing the outer leaflet of the membrane (Schachter et al 1983), comprised primarily of phosphatidylcholine, with phospholipid therapy, is our highest priority in addressing chronic illness and hypercoagulation.<sup>34</sup>

## THE VISUAL CONTRAST SENSITIVITY TEST

Our clinical approach is to first confirm that neurotoxin mediated illness could in fact be a problem for the patient via the Visual Contrast Sensitivity test that isolates deficits in velocity of flow in retinal capillaries. If the

*given with EDTA or DMPS 2:1.}*

<sup>30</sup> *{the inside of the blood vessel is lined with flattened out endothelial cells; those cells have a face toward the blood vessel canal or opening - i.e. the plasmic side - and one side faces the muscular center part of the artery wall.}*

<sup>31</sup> *{LDL = low density lipoproteins}*

<sup>32</sup> *{please note: by mentioning spiroketes, we are talking Lyme and other occult bacterial infections}*

<sup>33</sup> *{and wow, I never knew that!}*

<sup>34</sup> *This paragraph is sheer poetry to me. Read it again, slowly.*

patient scores poorly on this test then the evaluation may include screening for cytokine elevations followed by coagulation and red blood cell lipid testing through Johns Hopkins *with* interpretation through BodyBio. (For pediatric patients the Heidelberg Retinal Tomogram Flow Meter Evaluation may be performed in place of the Visual Contrast Test by an ophthalmologist.) *{Dr. B. does not do this test}*

### NEUROTOXINS AND CYTOKINES

Once neurotoxins enter the cell they move toward the nucleus turning on, indirectly, the production of cytokines such as TNF alpha, IL6, and IL-1Beta<sup>35</sup> (Shrief and Thompson 1993, Tsukamoto 1995, Abordo et al 1997, Rajora et al 1997, Brettelal 1989, Hassen et al 1999, Davidson 2001). TNF alpha will stimulate macrophages in the body (garbage clean up cells) to become active. The white cells are also induced to gather in the area of the cytokine (TNF alpha) release. In addition, TNF alpha induces endothelial cell adhesion.

Endothelial cells which line the blood vessels of the body become "sticky" in conjunction with the increase in white cells. Increased blood viscosity results in restricted blood flow in neurotoxic patients leading to fatigue and discomfort, and quite possibly disturbed toxic photoreceptor lipid structures that become compromised with subsequent reduction in visual performance. *{ergo, the test above}*

The cellular impact of biotoxin and heavy metal burdens results in: *{again, I have made a numbered list}*

1. disturbed prostaglandin synthesis, *{causing inflammation: red, hot, tender, sore, friable, weak, swollen, etc. - all the ways we can describe bodily injury.}*
2. poor cellular integrity, *{cells leak out their fluid, become inflexible and leak ions, age and die like the skin of an old person, undergo apoptosis, which is cell death}*
3. decreased GSH levels (DeLeve and Kaplowitz 1990, Dentico et al 1995, Hayter et al 2001, Miles et al 2000, Nagai et al 2002, Zalups and Barfuss 1995, Watanabe et al 1988, Fernandez- Checa et al 1996), *{glutathione, which starts detox in the liver},*
4. significant suppression of omega 6 arachidonic acid and
5. marked elevation of Renegade Fats and ultimately with
6. demyelination (depressed DMAs). *{the reason they called their paper neuromembrane disease - rather than "all-cell-membrane disease". The nerve is the ultimate and final membrane damaged, but all cells are similarly damaged and the illness is characterized by the primary, initial, or majority ,or primary foci of cells damaged, e.g. blood vessel lining, liver, kidney , joint membranes, etc..}*

The presence of VLCFAs are evidence of peroxisomal dysfunction<sup>36</sup> and suppression of the beta oxidation of lipids and cellular respiration.

Renegade fats (VLCSFAs, Odd Chains, Branched Chains) are represented as an increase in fat content in the brain as discovered in stroke patients examined by Stanley Rapoport, Chief of the Laboratory of Neuroscience at the NIH.<sup>37</sup>

Biotoxins and heavy metals are lipid soluble thus the effect upon cellular processes and hepatobiliary function is often gravely deranged. Often, patients do not possess a gross burden of toxins but rather a burden that has a finite impact upon the cell by blocking receptor sites such as G proteins, which act as a relay system through the cell.

Peroxisomes, most prevalent in the liver and kidney, are organelles within the cell that play a crucial role in clearing xenobiotics and the third phase of detoxification. Peroxisomes are intimately involved in cellular lipid metabolism (Bentley et al 1993, Mannaerts and Van Veldhoven 1992, Luers et al 1990, Leiper 1995) as in the biosynthesis of fatty acids via  $\beta$ -oxidation involving physiologically important substrates for VLCFAs, thromboxanes, leukotrienes and prostaglandins. *{bad stuff}*

The creation of a prostaglandin is an oxidative event (Diczfalusy, 1994). Inappropriate use of antioxidants (mega-dosing) will inhibit  $\beta$ -oxidation, the production of prostaglandins and cellular metabolism; thus the liberal use of potent antioxidants would be contraindicated in the buildup of Renegade fats, such as VLCFAs, Odd

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<sup>35</sup> *{TNF = tumor necrosing factor; the two IL types = interleukins}*

<sup>36</sup> *{peroxisomes are the somes or "little bodies" inside the cells that hold the peroxide, i.e. the extra H+ or electron on the oxygen molecule, needed for cellular energy production. Oxygen is transported and moved around as peroxide}*

<sup>37</sup> *{I never thought of brains getting fat when they get out of shape, in the sense that the rest of our bodies get fat!}*

Chain and Branched Chains (Akasaka et al 2000), which are the hallmark of toxicity (Kane and Kane 1997, Kane 1999, Kane 2000, Roels et al 1993, Rustan et al 1992).<sup>38</sup>

Peroxisomal oxidation enzymes are suppressed by elevation of cytokines such as TNFalpha (Beier et al 1992). Individuals with immune, CNS {*central nervous system*}, cardiac, GI {*gastrointestinal*} and endocrine disorders often present with complex xenobiotics involving disturbances in the cytochrome P450 superfamily (hepatic detoxification difficulties) which parallels disturbances in peroxisomal function. {*the reasons peroxide IVs often help these situations.*}

The cytochrome P450s<sup>39</sup> are responsible for the biotransformation of endogenous compounds including fatty acids, steroids, prostaglandins, leukotrienes and vitamins as well as the detoxification of exogenous compounds resulting in substantial alterations of P450s (Guengerich 1991) as xenobiotics may turn off or greatly reduce the expression of constitutive isoenzymes (Sharma et al 1988).

### TARGETED NUTRITIONAL INTERVENTION FOR TOXICITY

Inadequate stores of arachidonic acid can compromise P450 function (McGiff 1991). Oral application of hormones such as pregnenolone, DHEA (Di Santo et al 1996, Ram et al 1994, Rao et al 1993) and thyroid {will} stimulate peroxisomal proliferation and the  $\beta$ -oxidation of Renegade fats, as would nutrients (riboflavin, pyruvate, manganese) and oxidative therapies.

Anti-oxidants slow cellular metabolism and must remain in the proper balance with all the essential nutrients and substrates (lipids, protein) to maintain metabolic equilibrium. Removal of renegade fats in the diet is accomplished by the avoidance of mustard, canola oil (Naito et al 2000), peanuts and peanut oil<sup>40</sup> which contain VLCSFAs that can challenge patients with liver and CNS toxicity {*and certainly those with endothelial or blood vessel disease, which essentially is all of us.*}

The oral use of butyrate,<sup>41</sup> a short 4-carbon chain fatty acid, is of striking benefit (Fusunyan et al 1998, Segain et al 1983, Yin et al 2001) in mobilizing renegade fats, lowering TNFalpha, sequestering ammonia, and clearing biotoxins.

### Omega 3s and Omega 6s

#### RATIO

The manipulation of lipid distortion involves two basic essential fats: omega 6 and omega 3. The body loses its ability to metabolize fats in states of toxicity and therefore becomes depleted in the eicosanoids and prostaglandins. Essential fatty acids are the precursors to the regulatory prostaglandins which are "local hormones" providing the communication controlling all cell to cell interactions. The human cell membrane cannot be supported nor its function controlled without respect to lipid substrate, yet fatty acid metabolism has been poorly delineated in the medical literature.

In states of toxicity it is paramount to stabilize omega 6 fatty acids and the lead eicosanoid, Arachidonic acid (AA), before introducing omega 3 lipids. (Attwell et al 1993) There exists a crucial balance between omega 6 and omega 3 fatty acids in human lipid metabolism which has only recently been brought into clearer focus through the work of Yehuda (1993, 1994, 1995, 1998, 2000, 2002). His development of the SR-3 (specific ratio of omega 6 to omega 3) has revealed that the optimum ratio of omega 6 to omega 3 FAs is 4:1.<sup>42</sup> {*Or, conversely, that omega 3 to 6 is ideally 1:4*}

AA, the lead eicosanoid, must be stable first, along with the other omega 6 EFAs, before omega 3 fatty acids are introduced and balanced. Clinicians are often met with poor patient outcomes when merely administering omega 3 lipids without first introducing omega 6 fatty acids, stabilizing the structural lipids, increasing the fat

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<sup>38</sup> {*so... how much antioxidant is too much?*}

<sup>39</sup> {*P450: a family of enzymes numbering in the hundreds, that detoxify. They shine blue light, at 450 nanometer wave length. One's share and function of these enzymes is individually determined by his genetics. Each enzyme can be damaged by an environmental insult, so, again, genetics are not everything.*}

<sup>40</sup> {*more things to avoid*}

<sup>41</sup> {*I used this routinely in bowel dysbiosis. This is one of the things your probiotics or "friendly flora" manufacture for you. It has to be up or colon cancer results. I will now begin to stock it for toxic patients, whether their CDSA (stool test) shows deficient or not!*}

<sup>42</sup> {*until I attend a conference on this matter, I will only go up to the 1:3 ratio I mentioned earlier. Somewhere along the line I was taught that the normal ratio is 1:3*}

content of the diet, stimulating the  $\beta$ -oxidation of renegade fatty acids, flushing of the gall bladder/biliary tree and supporting digestion of fats with bile salts and lipase.<sup>43</sup>

### **{A CURSORY EXPLANATION OF NORMAL CELL MEMBRANES**

*better stated at the beginning of the article, as least for my reading -so I moved it and repeat it here !}*

An optimum balance of fatty acids make up the dynamic {cell} membrane. {whether neural, hepatic, endothelial, etc.} The membrane of every living cell and organelle is composed of two fatty acid tails facing each other. This bilipid layer is so minute (3.5 nanometers) that it would take 10,000 membranes layered on top of each other to make up the thickness of this paper. Yet the dynamics that occur within this tiny envelope with organelles prancing up and down the cytoskeleton microtubules is a microcosm that is a challenge for the human mind to envision. Mercury toxicity damages the microtubule structure of the cell.<sup>44</sup> All cells must synthesize molecules and expel waste.

All cells must create, through gene expression, the proteins needed for cellular gates {receptor sites} embedded in the membrane, {that serve} as ion channels and receptors. The ultimate control of how those peptides behave rests with the character of the membrane while the integrity of the membrane rests with the structural (oleic, stearic, palmitic, cholesterol) and essential lipids (omega 6, omega 3). Without control of membrane function through lipid manipulation, detoxication is compromised. In essence, the life of the cell is intimately tied to health of the membrane and the health of the entire organism.

Our clinical protocol is to initiate treatment with changing the patients' overall diet, addressing the lipid balance and especially the outer lipid leaflet of the cell membrane through fatty acid therapy and the addition of supplementation targeted towards dissolving fibrin, clearing the liver/biliary tree, and healing the cell membrane. Patient progress is evaluated through the Visual Contrast Test and repeat lab evaluation.

### **REGARDING HEPARIN**

Blood thinning agents such as Heparin and Warfarin<sup>45</sup> increase blood flow around the blocked endothelium: however, reconstituting membrane fluidity can directly address coagulation in a natural restorative way. Vibrant healthy membranes will not permit agglomeration. The high polyunsaturated lipids with a preponderance of phosphatidylcholine on the plasmic surface precludes undesirable clumping to occur. Treatment modalities should address dissolving fibrin and healing the cell membrane.

### **SPREADING INFECTION**

It has been suggested that the use of heparin will address hypercoagulation (excess clotting). Recent data from JAMA (Stephenson 2001) indicates that the use of low dose heparin may transform a 'benign fungal infection into a toxic shock-like reaction'. This research was presented at the 39th annual meeting of the Infectious Diseases Society of America in 2001 by Margaret K. Hostetter, M.D. of Yale University School of Medicine (Hostetter 2001 and San-Blas et al 2000).

Hostetter and colleagues found that Candida albicans can attach to host cells and form invasive hyphae. Low dose heparin, utilized in procedures for hospitalized patients through the practice of heparin in intravascular catheters, may transform C. albicans into a life-threatening pathogen. Hostetter was able to identify a gene, INT1, encoding a C. albicans surface protein, Intlp, which was linked with adhesion, the ability to grow filaments and ultimately virulence of C. albicans of a systemic nature.<sup>46</sup>

The use of heparin raises the cytokines, TNF alpha and IL-6 (Stephenson 2001), in addition to Phospholipase A2 (Mudher et al 1999; Kern et al 2000; Farooqui 1999; Verity et al 1994). Biotoxins which form neurotoxins, may create a state of hypercoagulation from the rise in TNF alpha. Consequently, the use of heparin may exacerbate the hypercoagulation and the neurotoxic condition. The source of the problem - biotoxins, which have formed neurotoxins creating a state of hypercoagulation - must be addressed from the context of the underlying neurotoxic condition and healing the cell membrane.

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<sup>43</sup> {that is why we must continually go to conferences and learn each new application of this advance research!}

<sup>44</sup> {as do other heavy metals, each having an affinity for different cells or organs or organelles}

<sup>45</sup> these are the anti-coagulants commonly used in standard medicine, to prevent further strokes, after heart attacks, etc.}

<sup>46</sup> {At last the establishment medicine is beginning to work on, and presumably believe in, the Yeast Syndrome. Note that it is in context to the "there is a gene" theme. Reminds me of M.L. King with his "I Have a Dream speech?"}

*{Perhaps more than yeast behave this way. When lipids are disturbed, other pathogens may become stealth organisms, or become pathogenic and stick to cells and invade, or change their byproducts to more toxic forms, etc..}*

### **EVIDENCE BASED CLINICAL PROTOCOLS**

By stabilizing lipid status with intravenous Phospholipid exchange and oral EFA supplementation we have remarkable tools to unload the body burden of neurotoxins (Jenkins et al 1982, Cariso et al 1983, Jaeschke et al 1987, Kolde et al 1992) in both pediatric and adult populations, without side effects. Oral use of phospholipids in a Liver Flush is also an effective intervention in addressing neurotoxic syndromes.<sup>47</sup>

Through isolating individual fatty acids and dimethylacetyls in red cells we can now examine the cellular integrity/structure, fluidity, the formation of renegade fats that impair membrane function, myelination status, and the intricate circuitry of the prostaglandins. The systemic health of the individual patient may be reached and targeted nourishment utilized through evidence based intervention which may yield positive patient outcomes.

Healing the membrane is virtually... healing the brain. (or nerves, or liver, or kidney, or lung, or etc., etc..)

### **REFERENCES FOR THIS ARTICLE**

Neal Speight, M.D. may be reached at Center For Wellness in Charlotte, NC.  
Patricia Kane, Ph.D. at the Haverford Wellness Center in Havertown, PA.  
or to obtain the 'The Detox Book: Detoxification of Biotoxins in Chronic Neurotoxic Syndromes' at  
888-320-8338 or 856-825-8338.

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<sup>47</sup> *{OK. Go add that to your next liver flush, and start the next flush next week! We stock this in the office for memory and brain conditions. Use a lot of pills - or liquid.}*

**From by Dr. Braun**  
**SUMMARY OF at least 16 THINGS WE CAN DO NOW**  
**comprised of ~**

**a quote from the paper, followed by the suggested approach to treatment, underlined.**

- (1) "Unhealthy bacteria have been known to colonize the liver and its biliary system. These bacteria as well as viruses, spirochetes<sup>48</sup>, dinoflagellates: "  
**ACTION: get rid of them. Do the CDSA stool tests and treat accordingly. Do regular GB-liver flushes and coffee enemas.**
- (2) "increased biliary sludge may be due to prolonged fasting, low fat intake, high carbohydrate diets or exposure to pathogens.<sup>49</sup> Restriction of dietary fat may impair biliary flow: "  
**ACTION: limit your fasts, do not adhere to low fat diets.. cut back on carbs, again, get rid of pathogens. and do your GB flushes!**
- (3) "Biotoxins and heavy metal exposure co-exist within the cell membrane and fatty tissue requiring consideration for both types of toxicity in regard to patient intervention".  
**ACTION: address both issues ~ toxic metals and environmental toxins .**
- (4) "By stabilizing glutathione we in turn impact metallothionein markers, glycoaminoglycans or GAGS, {as forms of glucosamine sulfate, etc.} methylation, sulfation {take DMG, dimethyl-glycine, and MSM, for methyl and sulfur, and garlic, and onions}, hepatic and renal function as we introduce treatment protocols for detoxication with gentle, natural modalities that unload cellular toxicity safely." :  
**ACTION: sauna, exercise, gall bladder flushes and coffee enemas, take your supplements.**
- (5) "GSH infusion by fast IV push"  
**ACTION: take orally, use IV when especially toxic, and take NAC orally, daily, once mercury is removed.**
- (6) "Saturated or monounsaturated fatty acids with a length of 16 or 18 carbons and polyunsaturated fatty acids of 18 to 22 carbons."  
**ACTION: yes, that did say saturated fats, as in animal fats. Eat meat.**
- (7) "Inappropriate use of antioxidants (mega-dosing) will inhibit  $\beta$ -oxidation, the production of prostaglandins and cellular metabolism, thus the liberal use of potent antioxidants would be contraindicated in the buildup of Renegade fats":  
**ACTION: do not over-anti-oxidize.**
- (8) "Anti-oxidants slow cellular metabolism and must remain in the proper balance with all the essential nutrients and substrates":  
**ACTION: balance**
- (9) "Oral application of hormones such as pregnenolone, DHEA (Di Santo et al 1996, Ram et al 1994, Rao et al 1993) or thyroid" :  
**ACTION: take them**
- (10) "... (riboflavin, pyruvate, manganese) and oxidative therapies" : *Oxidative therapies mean - IV peroxide, UV therapy (UV = ultraviolet), hyperbaric, ozone, etc..*  
**ACTION: take them, and others, (whatever they prove to be. )**
- (11) "avoidance of mustard, soy, canola oil (Naito et al 2000), peanuts and peanut oil" :  
**ACTION: more to avoid**
- (12) "The oral use of butyrate, <sup>50</sup> a short 4-carbon chain fatty acid, is of striking benefit:"

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<sup>48</sup> {please note: by mentioning spirochetes, we are also saying Lyme and other occult bacterial infections}

<sup>49</sup> { or food allergy, which is a toxic state.}

<sup>50</sup> {I once used Butyrate routinely in bowel dysbiosis. This is one of the things your probiotics or "friendly flora"

**ACTION:** *begin this.* Add to GB flush. Those with low levels in stool tests, take for 6 months and retest.

- (13) "when overdosing with marine or flax oil establishing the {proper} balance of the EFAs is profoundly impaired" : *destabilizes membranes --*

**ACTION:** *get ratio to at least 1:3 omega 3 to 6s, if not the ideal 1:4.*

- (14) "Healing the outer leaflet of the membrane (Schachter et al 1983), comprised primarily of phosphatidylcholine, with phospholipid therapy, is our highest priority in addressing chronic illness and hypercoagulation":

**ACTION:** *obtain this form of IV - two per week, for at least 20-40 treatments. Alternate with EDTA chelation each 3rd IV, or EDTA + DMPS, as needed individually.*

- (15) "AA, the lead eicosanoid, must be stable first along with the other omega 6 EFAs before omega 3 fatty acids are introduced and balanced. Clinicians are often met with poor patient outcomes when merely administering omega 3 lipids without first

- (a) introducing omega 6 fatty acids,
- (b) stabilizing the structural lipids,
- (c) increasing the fat content of the diet (proper kinds of fats),
- (d) stimulating the  $\beta$ -oxidation of renegade fatty acids,
- (e) flushing of the gall bladder/biliary tree and
- (f) supporting digestion of fats with bile salts and lipase."

**ACTION:** *begin the omega 6's and then in 2-3 weeks, ad the Omega 3's. Then do the rest.*

- (16) Oral use of phospholipids in a Liver Flush is also an effective intervention in addressing neurotoxic syndromes<sup>51</sup>:

**ACTION:** *Add 3 capsule of phosphatidylcholine and phosphatidylserene, 3 x daily during the days of your flush.*

**Dr. Braun is advising 2 PC IVs for each 1 chelation.**

**or**

**2 PC IVs per week without chelation.**

**After the first few weeks of PC twice a week, we may reduce to 1 weekly.**

**However, 1 x weekly, from the beginning, is proving beneficial as well, if 2 per week is not feasible.**

**We will take PC orally and attend to all the above details, for maximum results.**

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*manufacture for you. It has to be up or colon cancer results. I will now begin to stock it for toxic patients, whether their CDSA (stool test) shows deficient or not!*

<sup>51</sup> {OK. Go add that to your next liver flush, and start the next flush next week! We stock this in the office for brain (memory) and brain conditions. }